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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/437,607	11/10/1999	RUFUS L. CHANEY	1797.0090005	8216

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EXAMINER

IBRAHIM, MEDINA AHMED

ART UNIT	PAPER NUMBER
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1638

25

DATE MAILED: 06/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.  
09/437,607

Applicant(s)  
Chaney et al

Examiner  
Medina Ibrahim

Art Unit  
1638



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on Feb 13, 2003
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-4, 8-18, 38-40, 48, and 49 is/are pending in the application.
- 4a) Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 8-18, 38-40, 48, and 49 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some\* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\*See the attached detailed Office action for a list of the certified copies not received.

- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). \_\_\_\_\_ 6) ☐ Other:

### **DETAILED ACTION**

Applicant's response filed 2/17/03 in reply to the Office action mailed 08/13/2002 and amendment D have been entered. New claim 49 has been added. Therefore, claims 1-49 are pending.

Claims 1-4, 8-18, 38-40, and 48-49 are under examination.

The declaration, under 37 CFR 1.132, of Yin-MING has been considered.

All previous rejections and objections not stated below have been withdrawn.

This Office action contains NEW GROUNDS OF REJECTION not necessitated by Applicants' amendments. Therefore, this action is non-final. The delay in applying these new grounds of rejection is regretted.

#### ***Claim Rejections - 35 USC § 112***

Claims 1-4, 10-12, 16-18, 38-40 and 48-49 are rejected under 35 U.S.C. 112, **first paragraph**, because the specification, while being enabling for the use of the hyperaccumulator of Alyssum plant species that accumulates nickel and related heavy metals including cobalt, zinc, manganese and cadmium, does not reasonably provide enablement for the use of any hyperaccumulator plant that accumulates the specified amount of heavy metals from soil as recited in the claims. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

The claims are broadly drawn to a method for selectively increasing the amount of at least one metal recovered from metal-containing soil comprising elevating the pH of the soil from an initial pH to a raised pH of 5.6 to 9.5, cultivating at least one metal hyperaccumulator plant including a Ni-, Co, Cd, Mn, and Zn hyperaccumulator plants, in the soil having the raised pH, wherein said plants accumulate at least one of said metals in above-ground tissues, harvesting said plant, and recovering metal from the harvested plant, and whereby the concentration of said metal in the above ground tissues exceeds the concentration of said metal in the soil by factor of 2, 3, or 4. The claims also encompass soil treatments including adding agents such as lime and equivalents to increase soil pH and maintaining soil calcium concentration of 20-80%. In contrast, Applicant provides guidance only for the use of Alyssum species, wherein the soil conditions are optimized for the recovery of Ni and related heavy metals by Alyssum plant species. Applicant has not provided guidance for the use of a non-Brassicaceae plant, and the soil conditions, such as soil pH, Ca concentration, fertilizers, and chelating agents which would allow said non-Brassicaceae plants to grow and accumulate said metals at concentrations that exceed the concentration of said metal in the soil by factor of 2, 3, or 4 as claimed in claims 16-18 and 38-40. No guidance is provided for obtaining or evaluating plants which hyperaccumulate metals from structurally and biochemically complex media such as soil, which contains a multitude of microorganisms which interact in metabolizing, sequestering and/or secreting various metal ions. Furthermore, the soil microorganisms would alter the

acidity of the soil due to their metabolic activity, which alteration would affect the soil's ability to bind the heavy metal ions, which would affect the ability of plants to recover such ions from the soil and hyperaccumulate them. It is unclear if the method provided in the specification for removing heavy metals by Brassicaceae plants is broadly applicable for other unidentified metal-hyperaccumulator plants. Applicant has not provided guidance for non -Brassicaceae plant that hyperaccumulates metal under the defined soil conditions. The soil conditions of soil pH of 5.6 to 9.5 and calcium concentration of 20-80% have been shown to work only for Brassicaceae plant species (according to the declaration of Yin-Ming Li, paragraph 8). To claim any and all hyperaccumulate plants without any specific guidance as how to determine which plants would be metal hyperaccumulator under the defined conditions is an invitation to experiment requiring undue experimentation. Therefore, in view of the above, the claimed invention is not enabled throughout the broad scope.

The declaration under 37 CFR 1.132 of Yin-MING filed 13 March 2003 has been fully considered but was found persuasive only with regard to the art rejection under 35 U.S.C. 103. The declarant states in paragraph 11 of the declaration that additional studies in the greenhouse and laboratory with non-Alyssum species such as *Thlaspi* and *Berkheya* have confirmed that the claimed method can be used with plant hyperaccumulators from *Brassicaceae*. However, there is no indication from the declaration or Applicant's specification that non-Brassicaceae hyperaccumulators are also useful in the claimed invention.

***Claim Rejections - 35 USC § 112, 2nd paragraph***

1. Claims 1-4, 8-18, 38-40, and 48-49 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claims are indefinite in the recitation of "at least about" as it unclear whether Applicant intends, for example, "at least 1000" which does not include anything less than 1000, or "about 1000" which can includes less than 1000 (999.9 is about 1000). It is suggested that "about" be deleted. Claim 1 is indefinite for failing to recite complete method steps that resulted in an increase in the amount of metal recovery.

In claims 1, 10 and 49, part (a), "elevating" should be replaced with ---adjusting---, since "elevating" does not work for all soil conditions.

In claim 4, "limestone equivalents" is unclear. The specification fails to define what constitutes "limestone equivalents", and hence the metes and bounds of the claims are unclear. Does "mixtures thereof" refer to "limestone equivalents" only?.

In claim 11, is the 20-80% by volume, by weight or other ?

In claim 12, is Applicant referring to harvesting step c or recovering step d.

Clarification is required.

~~In claim 49, "in a plant" should be inserted in the preamble, for clarification.~~

***Double Patenting***

Claims 1-4, 8-18, 34-40, and 48-49 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-12

of U.S. Patent No. 5, 944, 872, as stated in the Office action. Applicant's response has indicated that a Terminal Disclaimer to overcome this rejection will be submitted in a supplemental response (response pg. 4-5). The double patenting rejection will be held in abeyance pending submission of the Terminal Disclaimer.

**Remarks**

No claim is allowed.

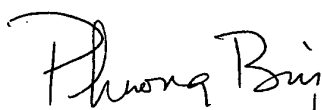
Papers relating to this application may be submitted to Technology Sector 1 by facsimile transmission. Papers should be faxed to Crystal Mall 1, Art Unit 1638, using fax number (703) 308-4242. All Technology Sector 1 fax machines are available to receive transmissions 24 hrs/day, 7 days/wk. Please note that the faxing of such papers must conform with the Notice published in the Official Gazette, 1096 OG 30, (November 15, 1989).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Medina A. Ibrahim whose telephone number is (703) 306-5822. The Examiner can normally be reached Monday -Tuesday from 8:00 AM to 5:00 PM and Wednesday-Thursday from 9:00AM to 3:00PM

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Amy Nelson, can be reached at (703) 306-3218.

Any inquiry of a general nature or relating to the status of this application should be directed to the receptionist whose telephone number is (703) 308-0196.

May 30, 2003

  
6/2/03  
PHUONG T. BUI  
PRIMARY EXAMINER